

Watch out for Hessian fly infestation in western Oregon cereals - A re-emerging issue?

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What to look for in the field?

Larvae (immatures) feed by scratching plant tissue and sucking juices that ooze from the irritated surface of the stems of wheat (spring and winter types) and barley. Affected plants are stunted and may have abnormal leaves (Figure 1). When scouting fields look for stunted plants with dark wide leaves. Leaves may appear thickened, erect, and bluish-green in color. In cases of heavy infestations, the central stem is often missing. Infested stems often break and fall over after head emergence. Heads may also look “bleached” or partially turn white as they mature. Grain yields can be greatly reduced. Economic loss occurs when from 15 to 30 percent of the tillers are infested.



Figure 1. Infested plant. Photo credits. A. Knutson, Texas A&M University

Larvae are small ~3/16 inch, greenish-white, legless, headless, and are found underneath lower leaf sheaths (Figure 2). Pupae are ~3/16 inch and are represented by brown seed-like cases containing larvae, often referred to as a "flax seed." The pupae or "flaxseeds" are commonly found beneath the leaf sheath above the surface of the ground, as high as the second or third joint (Figure 2). Adult flies have a red-brown to dusky-black body and dusky wings. They resemble mosquitoes in form and are about 1/6 inch long. They are short-lived and can be hard to find in commercial fields. Watch [YouTube video](#) from NC State Extension for scouting techniques.

Life cycle and behavior

The Hessian fly has four stages in its life cycle: egg, larvae (maggot), pupa (flaxseed), and adult (fly) (Figure 3). The small mosquito-like adults live no more than 4 days. On warm days in the egg laying season (**spring and fall**), adults may be seen flying about and laying eggs on wheat or barley leaves.



Figure 2. Larva and pupae (flax seed) of Hessian fly. Photo credits. N. Kaur, Oregon State University.

On cool days, or in the early morning when there is a heavy dew, the flies are less active and remain hidden within the leaves or on the ground. The females deposit multiple eggs (up to 200 eggs per female) in the grooves on the upper side of leaves. The eggs are orange or pink when first laid.

Young larvae hatch from the eggs in 3 to 10 days, depending on the environmental conditions (air temperature and rainfall). They then migrate down the leaf grooves to settle behind the leaf sheaths of young tillers or just above the nodes on jointed wheat or barley, which is where feeding occurs. During feeding, the larvae turn white and take on a smooth, glistening appearance. Mature larvae show a translucent greenish stripe down the middle of the back through which the

contents of the stomach may be seen. Once full growth is attained—in 3 to 6 weeks—the larval skin hardens to form a dark brown puparium, commonly referred to as the “flax seed”. Non-feeding larvae within the puparia remain there for various lengths of time before pupating and emerging as adult flies.

The Hessian fly usually has *two to three partial generations per year*, one to two in the spring and one in the late summer or early fall.

Occasionally a second generation will occur in

the spring. Usually, the flaxseed of the spring generation spend the summer in wheat stubble and produce another emergence of flies in late summer or early fall. **Fall-generation flies deposit eggs on volunteer wheat or early-sown winter wheat.** Larvae from such eggs overwinter in the flaxseed stage and produce flies in the spring.

Predisposing factors. Rain in late August or September, accompanied by cooler temperatures, are key factors that prompt pupation and adult emergence in the fall. In the spring a mean temperature of 50° F is usually required before fly emergence begins. In most years very little emergence occurs before April. Warm, wet weather in early spring can lead to heavy infestation in wheat and barley seeded in late February or March.

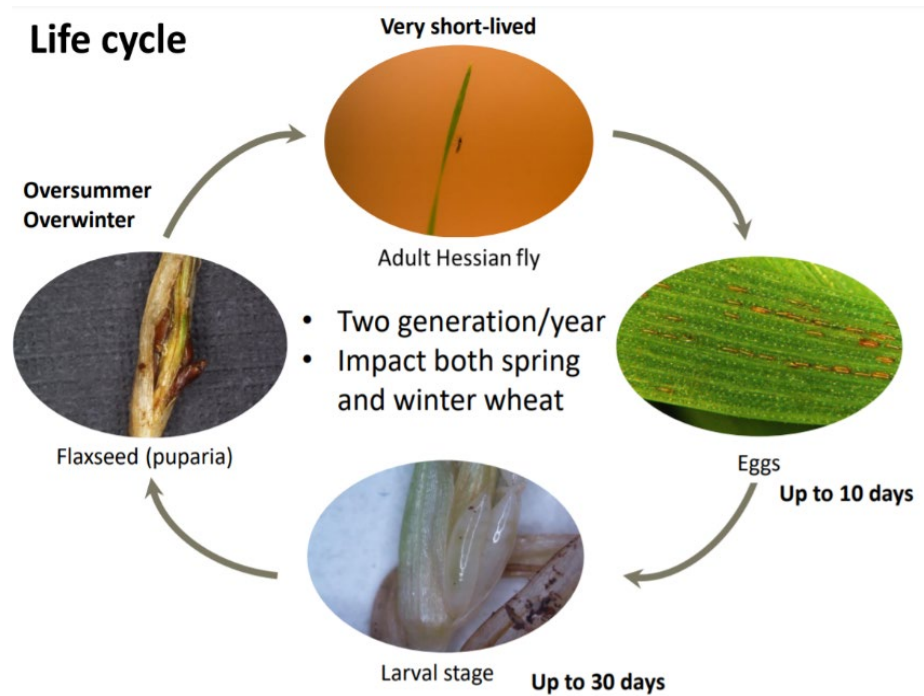


Figure 3. Life cycle of the Hessian fly. Photo credit. A. Rashed, University of Idaho.

Management

1. Planting *resistant cultivars* is the most effective approach to minimize losses to this pest. Consult your crop advisor or Extension agent to select recommended varieties for planting in your region.
2. Use insecticidal *seed treatments* applied to wheat and barley seed may help control Hessian fly. Using the high aphid rate of insecticide is recommended for best protection. Broadcast insecticide sprays are generally not effective on larvae or pupae once they are within the stems. Please refer to [PNW Insect Management Handbook](#) for chemical control recommendations.
3. Use *fly-free planting dates*. Winter wheat seeded after mid-October is usually free of this pest. Spring wheat seeded behind failed fall-seeded wheat is especially prone to attack. Delay planting of fall-seeded cereals so that they do not emerge until after the Hessian fly flight period has ceased. Generally, wheat sown after the second week in October will avoid Hessian fly damage. Fall-seeded wheat usually suffers less injury compared spring-seeded wheat. Generally, the fly prefers wheat more than barley.
4. Deep *plowing* soon after harvest is helpful if soil conditions permit. Plow wheat stubble soon after harvest to bury the pupae. Deep plowing prevents flies from emerging in the fall. Wheat stubble is a primary site where the Hessian fly both overwinters and oversummers. It is most responsible for the spring populations. Plow under or spray out any volunteer wheat on which fall generation adult flies may deposit eggs.

References

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